

# Mapping Knowledge Management for Technology Incubation

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**Abstract.** Knowledge Management is an approach which is based on the understanding that the task of the organization, which is understood by both of the reuse of knowledge and how the success of re-use of knowledge that has been created. Knowledge management is a series of activities that are used to identify, create, describe, and distribute knowledge. Business and Technology Incubator is one of alternative models of business development through incubation system that can help entrepreneurs to create and grow their business. This review will discuss mapping knowledge management for business and technology incubator that provides guidance to new business, support facilities and transfer of technology and business, especially for small and medium enterprises which will be a case study in Tegal regency, Central Java, Indonesia. The result showed that mapping knowledge management for business and technology incubator can help entrepreneur winning the competition in their business.

**Keywords:** Knowledge management · Technology incubation  
Business incubation · Small-medium enterprise

## 1 Introduction

Currently, it was realized that the organization is no longer superior relies solely on financial resources, buildings, land, technology, market position, and tangible assets other, but instead relies on knowledge assets (intangible). This is because knowledge is a resource that has the characteristics of strategic advantage. Knowledge management in recent years has become an interesting topic for discussion. Many interested parties to develop this concept both on the level of business and other non-profit organizations. Knowledge management concept originated and evolved in the business world. As a concept, knowledge management is applied in order to increase and improve the operation of the company in order to gain competitive advantage and increase profits. The basic objective is to harness knowledge for organizational excellence. Other objectives are: 1. Facilitating the transition period the old with the new. 2. Minimize the loss of “knowledge” because the release of employees. 3. Knowing the resources and critical knowledge areas owned and 4. Develop a method to prevent the loss of intellectual property companies. In relation to the incubation of technology, knowledge management is expected to encourage innovative entrepreneurs to grow into a strong and high-competitive businessman. This review will discuss the mapping knowledge management used in business and technology incubator that is an institution that

provides guidance to new businesses by providing support facilities and the transfer of technology and business, especially on small and medium enterprises, which will be a case study in Tegal regency, Central Java, Indonesia.

## 2 Knowledge Management

The term knowledge management first appeared in the business world. Knowledge Management is an attempt to increase the useful knowledge in the organization, including cultural familiarize communicate between personnel, provide opportunities for learning, and promote the sharing of knowledge. Where this effort will create and sustain an increase in the value of the core business competencies by leveraging existing information technology. It is excerpted from the opinions McInerney as follows: "Knowledge Management (KM) is an effort to increase of useful knowledge within the organization. Ways to do this include encouraging communication, offering opportunities to learn, and promoting the sharing of knowledge Appropriate artifacts" [1].

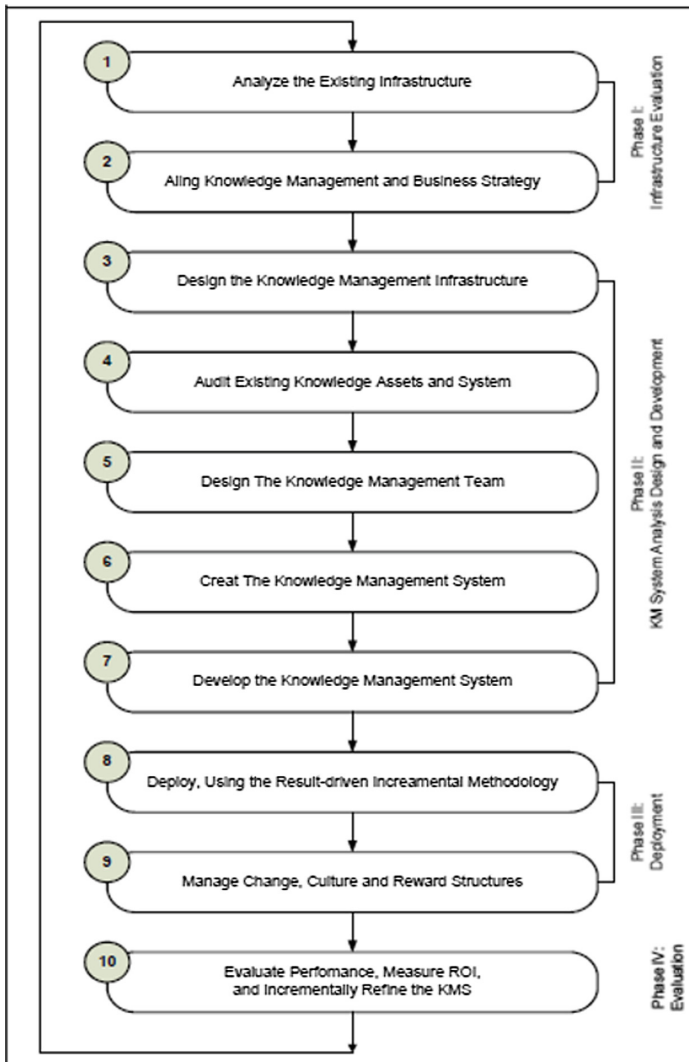
Nonaka and Takeuchi argue that the fundamental reason why Japanese company success, because they maintain the creation of organizational knowledge. The creation of knowledge is achieved through the introduction of synergic relationship between tacit and explicit knowledge [2]. Ikujiro Nonaka and Hirotaka Takeuchi (1995), distinguishing between tacit and explicit knowledge, and knowledge conversion model divide into 4 ways as follows:

- a. Tacit knowledge to Explicit knowledge; called externalization process
- b. Tacit knowledge to Tacit knowledge; called Socialization process.
- c. Explicit knowledge to explicit knowledge; called Combination process.
- d. Explicit knowledge to tacit knowledge; called Interlization process.

The essence of Knowledge Management is intended to represent a planned and systematic approach to ensure full use of basic knowledge of the organization, plus the expertise, competence, ideas, innovation, and potential individual ideas to create a more efficient organization and effective. Knowledge Management is an information management paradigm that comes from the idea that pure knowledge is actually embedded in the minds and mind of every human being. Thus it is necessary to build a mechanism for disseminating information and experience from the existing human resources in order to increase the knowledge of each actor activities in an organization [3].

With the development of technology, the issue of how to get a high level of competitiveness is also experiencing a transition from the use of (natural) resources to technology. The world has witnessed how countries are given the abundant natural resources would be a backward country. Indonesia one of them. Conversely a country that has often been at the forefront limitations because they were able to transform limitations into an opportunity. In the technological development of the most essential thing is the ability and knowledge. According to Nonaka and Takeuchi (1995) Japanese company's success is determined by the skills and expertise in the creation of knowledge organization. To perform this mapping knowledge management used

10-step method of knowledge management roadmap drawn up by Amrit Tiwana are broadly divided into four phases as follows [4]: i.e. 1. Evaluation of infrastructure, 2. Analysis, design and development of Knowledge Management System (KMS), 3. System deployment and 4. Evaluation (Fig. 1).



**Fig. 1.** 10-step knowledge management roadmap (Source: [4])

### 3 Technology Incubation

Business and technology incubator—hereinafter referred to as the incubator—has been developed in several developed countries. In the United States, for example, the incubator has grown since the early 1980s. In Indonesia, the incubator was developed in 1992, with the government's initiatives to develop cooperation with the university incubator.

Business and Technology Incubator (BTI) is one of the alternative models of business development through incubation system that can help the problems faced by entrepreneurs in order to create and grow a business world that is robust, efficient, especially for Small and Medium Enterprises. Or in other words, a business and technology incubator is an institution that provides guidance to new businesses by providing support facilities and the transfer of technology and business. Incubator role in the development of SMEs have also been getting a response and support from experts. Such support has spurred growth in many countries incubator. It is estimated that there are already more than 1,500 incubators in the world. Most of them are in the United States and European countries as well as more than 250 incubators are in developed countries.

Incubator role is very important for entrepreneurs/SMEs beginners (tenant innovative technology-based), as Incubator is designed to assist new and emerging businesses become independent entrepreneurs through a series of integrated assistance include the provision of office facilities, production testing, market testing, management consulting, technology, marketing and finance, training, and the creation of business networks both locally and internationally.

In general, the incubator is managed by a staff with a highly efficient management by providing services "7S", namely: space, shared, services, support, skill development, seed capital, and synergy [5].

- a. Space means incubator provides a place to develop business in the early stages.
- b. Shared means that the incubator provides office facilities that can be used together, for example, receptionist, conference rooms, telephone systems, fax, computers and networks, as well as security systems work.
- c. Services includes the management consulting and market issues, financial and legal aspects, trade and information technology.
- d. Support in this case the incubator helps access to research, professional networking, technology, international, and investments.
- e. Skill development can be done through training, and other human resource capacity building.
- f. Seed capital can be done through an internal revolving fund or by helping small businesses access to sources of financing or existing financial institutions.

- g. Synergy is a tenant and increased cooperation network with the universities, research institutions, private businesses, professionals as well as with the international community.

Different Types of existing incubator can be known by sponsors who support it. Currently, there are approximately 4 types of incubators [6] that can be used as a reference in the development of incubators in several countries, namely:

- a. Research, University, Technology-based Business Incubator

Development on the basis of research in universities and research institutions. The focus of the program is to provide services for personnel who are trained to become an entrepreneur is to transfer technology to enter the market (technology push) and meet a wide range of opportunities available (market pull).

- b. Public-private Partnership, the Industrial Development Incubator

These incubators generally live in an urban environment or industrial estate, where large companies could be involved in the development of small businesses as vendors for components and services.

- c. Foreign Sponsors, International Trade and Technology

The focus is usually incubator program for the development of international collaboration, technological and financial, to facilitate the entry of foreign small and medium enterprises in the local market (domestic).

- d. Other types of incubators

Incubator is a focus on a specific group development program. Incubator located in universities and research and development institutions, both public and private in general is kind of research incubator, university, technology-based business incubator. However, there are some differences between the incubators developed at the university with an incubator developed in research and development institutions.

Incubator contained in colleges more starting from a business idea and more require seed capital to realize its business. Meanwhile incubators (technology-based business incubator) developed by research and development institutions in the birth of new businesses based on technology, start-up incubation of existing prototypes are then performed assistance to be able to enter the market (Technology Push). Secondly, from business ideas, prototypes and technological services incubated as the market needs (market pull). In a simple conception of incubators that are common to research and development institutions shown in Fig. 2, which describes the start of the establishment of the incubator institutional infrastructure must be owned and incubation process to be passed by the tenant.

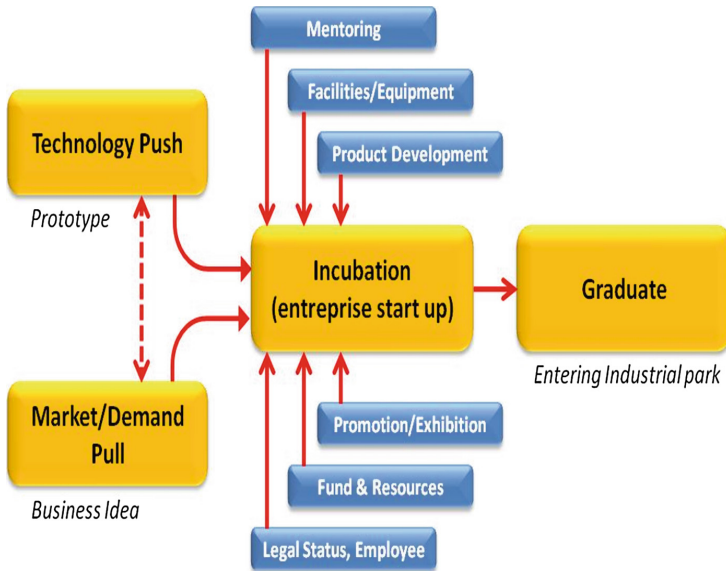


Fig. 2. Concept of incubator in research and development institutions

#### 4 Mapping the Knowledge Management for Technology Incubation

In carrying out this survey, we used descriptive research methodology. Descriptive research is one of the types of studies that aim to present a complete picture of the social setting or the relationship between the phenomena tested. In this study, researchers have had a clear definition of the subject of the research and who will use the questions in digging the required information. The purpose of descriptive research is to produce an accurate picture of a group, describe the mechanism of a process or relationship, give a complete picture either in the form of verbal or numerical, will present the basic information of a relationship, create a set of categories and classify the study subjects, describes a set of steps or processes, as well as to store contradictory information regarding the study subjects.

Mapping target is a cluster actors metal processing industry in Tegal, Central Java. The instrument used was the questionnaire contained in the annex. From the mapping results are then analyzed and resulted in a recommendation in terms of knowledge management, to improve the ability of industry cluster Tegal. Explanation of the results of the survey are as follows:

##### 1. Composition Role In Industry Cluster

Most businesses in Tegal regency has a role as a supplier industry with a percentage of 54 and 31% other actors act as supporting industries in the industrial cluster.

## 2. Ability Level Information Technology

In communicating, the business/industry/institution in Tegal most widely used mobile phone (hp). In communications, they rarely use the internet, as most businesses in Tegal not know or do not understand about how to use the internet or they call himself “clueless”. The greatest percentage of mobile phone use compared to other means of communication, namely by 48% and the least is internet/satellite is 4%.

Although only a small part in Tegal regency industry players who use the internet, but they used it well. Most use the Internet to communicate with its partners. But it is unfortunate few who use the Internet to exchange knowledge. Whereas it is necessary to supplement existing knowledge.

## 3. Knowledge Held

Of the total respondents only 33% said that the knowledge possessed sufficient, while largely claimed to have sufficient knowledge to support their performance.

## 4. Acquire Knowledge Mechanism

In improving the performance of companies/institutions in Tegal, how they obtain information/knowledge about largely done with the training, while some are doing internships at other companies. Very few who have to learn on their own initiative.

In improving the knowledge of being owned, they stated that local governments play a very great in helping improve their knowledge. This happens because the local government, especially in Tegal regency relevant agencies often conduct training/workshop. In addition approximately 20% of colleges also play a part in helping to improve the knowledge of the businesses/organizations in Tegal regency.

While all sources of knowledge acquired businesses/organizations in Tegal 25% comes from the district/city, only 17% were from outside the province. Of the respondents search the source of knowledge gained by involving other parties, mostly manifested in the form of a contract with the specialist/expert.

## 5. Knowledge Management Mechanism

After all the knowledge acquired, 29% of respondents stated that the knowledge that has been gained socialized to other employees in the environment where they work [7]. While only about 24% of respondents were directly test/apply the knowledge they have acquired.

The businesses/organizations in Tegal regency in documenting the knowledge they gain, the most widely documented in book form. Approximately 26% of respondents documented through journals, only 5% said that they were documenting the knowledge gained in the form of a website. In fact they do not have a database system for managing information/knowledge acquired.

Some 29% of respondents said that the constraints they face in acquiring and developing the knowledge needed due to its limited human resources and a lack of technology and existing infrastructure. But the most widely encountered obstacles are insufficient charge.

## 6. Mechanisms Dissemination of Knowledge

### (a) Internal Sharing

Of the total respondents, the majority of states that there is no mechanism to share knowledge internally for employees. Most respondents were in the company/institution is no mechanism to share knowledge internally, they use the periodic training as a way to share this knowledge, followed by conducting a limited training. Nothing at all who use mailing lists as a way to share knowledge.

## 5 Conclusion

Several conclusions can be drawn from the discussion in the previous chapters are as follows:

- a. Knowledge management is an approach which is based on the understanding that the task of the organization, which is understood by both the reuse of knowledge, and how the success of the re-use of knowledge that has been created.
- b. Knowledge management is a series of activities that are used by the organization or company to identify, create, describe, and distribute knowledge for reuse, unknown, and studied in the organization. This activity is typically associated with an objective organization and aimed to achieve a specific outcome such as shared knowledge, improved performance, competitive advantage, or higher levels of innovation.
- c. Business and Technology Incubator (BTI) is one of the alternative models of business development through incubation system that can help the problems faced by entrepreneurs in order to create and grow a business world that is robust, efficient, especially for Small and Medium Enterprises. Or in other words, a business incubator and technology is an institution that provides guidance to new businesses by providing support facilities and the transfer of technology and business.
- d. Incubator role is very important for entrepreneurs/SMEs beginners (tenant innovative technology-based), as Incubator is designed to assist new and emerging businesses become independent entrepreneurs through a series of integrated assistance include the provision of office facilities, production testing, market testing, management consulting, technology, marketing and finance, training, and the creation of business networks both locally and internationally.
- e. The incubation process stages tenant to tenant graduation (graduates) can be simplified into three (3) successive phases of activity, namely; Pre-incubation phase, the incubation stage, and Stage Post Incubation.

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